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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/986,459 | 11/08/2001 | Chi-Kyun Park | 3927-5 | 5072 |

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EXAMINER

TSANG FOSTER, SUSY N

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1745

DATE MAILED: 03/12/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|---------------------|--------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/986,459 | PARK ET AL. | |
| | Examiner | Art Unit | |
| | Susy N Tsang-Foster | 1745 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 3, 11-13, 19 and 27-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-10, 14-18, 20-26 and 30-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4 and 7</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of claims 1-36, a polymer containing pyridine as the species for component (A) and butanediol diglycidyl ether as the species for component (B) in Paper No. 9 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). The elected species read on claims 1, 2, 4-10, 14-18, 20-26, and 30-36.
2. Claims 3, 11-13, 19, and 27-29 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 9.

Information Disclosure Statement

3. The information disclosure statements filed on 11/8/2001 and on 7/17/2002 have been considered by the Examiner.

Drawings

4. The drawings are objected to because there is no number for the Figure since
37 CFR 1.74 states:

§ 1.74 Reference to drawings.

When there are drawings, there shall be a brief description of the several views of the drawings and the detailed description of the invention shall refer to the different views by specifying the numbers of the figures and to the different parts by use of reference letters or numerals (preferably the latter).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The abstract of the disclosure is objected to because it is too long in length. Correction is required. See MPEP § 608.01(b).

7. The disclosure is objected to because of the following informalities:

The Figure described in the Brief Description section of the specification should be referred to by a number for reasons cited above.

Page 8, lines 20-25 of the specification appear to contradict page 8, lines 26-27 of the specification because the first part of the specification states that the amount of liquid electrolyte can be 95 wt% or greater, for example, up to about 99.99 wt% which suggest that the balance of the gelling agent would be 0.01% by wt. However, page 8, lines 26-27 of the specification states that if the content of the gelling agent is less than 1 wt%, the electrolyte cannot form a gel at elevated temperature.

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On page 9, line 28, the phrase “nitrogen group” appears twice in succession.

On page 11, line 18, it is unclear what is meant by the word “non-examples”.

Throughout the specification, the trademark “Cellgard” appears to be spelled incorrectly and should be spelled as “Celgard”.

Appropriate correction is required.

Claim Objections

8. Claims 6-10, 14-17, 24, and 30 are objected to because of the following informalities:

In claims 8 and 24, the phrase “selected from” is improper Markush language and should instead be “selected from the consisting of”.

In claims 6-10, and 14-17, the preamble should be “[t]he gel polymer electrolyte” and not “[t]he gel polymer”.

In claim 30, the preamble should be “gellable electrolyte” not “gel polymer.”

Appropriate correction is required.

9. Claims 2, 8, and 24 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

In claims 2 and 8, the limitation “a nitrogen-group containing material (A)” is broader than the limitation “an amine-group containing material” recited in claim 1.

In claim 24, the limitation “a nitrogen-group containing material (A)” is broader than the limitation “an amine-group containing material” recited in claim 18.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 2, 4, 8-10, 14-17, 24-26 and 30-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2, 8, and 24 recite the limitation "the nitrogen-group containing material (A)" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

In claims 8 and 24, the limitation "polymers, copolymers, oligomers and monomers containing 6-membered aromatic heterocycles, 5-membered fused aromatic heterocycles and aromatic or non-aromatic tertiary amine compounds" is indefinite because it is unclear whether the polymers, copolymers, oligomers and monomers each contain all the following members of 6-membered aromatic heterocycles, 5-membered fused aromatic heterocycles and aromatic or non-aromatic tertiary amine compounds or alternatively, the polymers, copolymers, oligomers and monomers each contain one of the following members selected from the group consisting of 6-membered aromatic heterocycles, 5-membered fused aromatic heterocycles and aromatic or non-aromatic tertiary amine compounds.

For the purposes of prosecution, the limitation in claims 8 and 24 will be interpreted as "polymers, copolymers, oligomers and monomers each contain one of the following members

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selected from the group consisting of 6-membered aromatic heterocycles, 5-membered fused aromatic heterocycles and aromatic or non-aromatic tertiary amine compounds”.

In claim 10, the limitation “wherein material (B) includes an epoxy-group containing material and/or material (B) includes an epoxy group containing material and/or a an aromatic or non-aromatic halide material an aromatic or non-aromatic halide material” is indefinite because it is unclear what the choices for material (B) are as written in the limitation.

In claims 15-17, and 31-34, it is unclear what the weight percentages are based on. It appears from the specification that the weight percentages are based on the total weight of the electrolyte which includes the nonaqueous solvent, that salt, and the gelling agents. The Examiner is interpreting the weight percentages to be based on the total weight of the gel electrolyte in light of the specification.

Claims depending from claims rejected under 35 USC 112, second paragraph are also rejected for the same.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1, 2, 4-10, 14-18, 20-26, and 30-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Andrieu et al., “Solid Polymer Electrolytes Based on Statistical Poly(ethylene Oxide-Propylene Oxide) Copolymers”, Electrochimica Acta (1995), 40 (13-14), pp. 2295-2299.

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Andrieu et al. discloses a polymer electrolyte for rechargeable lithium batteries prepared from polyethylene oxide/polypropylene oxide block copolymers with terminal amino groups that are cured with butane diol diglycidyl ether in the presence of lithium perchlorate (LiClO_4) to give lithium electrolytes having conductivities of from 5×10^{-3} to $4 \times 10^{-5} \Omega \text{ cm}^{-1}$ (p. 2295 and page 2229).

The polyethylene oxide/polypropylene oxide block copolymers with terminal amino groups are polymers containing an amino group.

It is noted that applicants state on page 9, line 28 to page 10, line 1 that the nitrogen group in the gel polymer electrolyte serves to increase the cell voltage before the cell is actually charged. Thus, the rechargeable lithium batteries using this electrolyte would inherently have a pre-charge voltage of at least about 0.3 V or greater due to the presence of the amino groups in the polymer electrolyte.

The court has held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP 2112 and 2112.01. When the Examiner has provided a sound basis for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

14. Claims 1, 2, 4-10, 14-18, 20-26, and 30-34 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Andrieu et al. (US 5,202,009).

See abstract, col. 2, lines 31-38, and Example 4 of the reference.

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- 11
3/19/03
- 1, 2, 4-10, 14-18, 20-26 and 30-36
15. Claims ~~rejected~~ under 35 U.S.C. 102(b) as being anticipated by Arbizzani et al. ("Impedance Spectroscopy in electrode/electrolyte interface investigations", Solid State Ionics, 72, (1994) pp. 115-121).

Arbizzani et al. discloses a polymer electrolyte for lithium batteries (page 115) comprising a hybrid electrolyte based on a bis-amino PEO-PPO (polyethylene oxide/polypropylene oxide) copolymer cross-linked by a diepoxy compound in the presence of propylene carbonate and LiClO₄ (page 115). The hybrid electrolyte is obtained by crosslinking bis-amino PEO-PPO copolymer (MW=2000) and LiClO₄ (O/Li=10 in the molar ratio calculation only the oxygen atoms in the polymer chain have been considered) in the presence of propylene carbonate (PC by 50 wt%) by reaction with 1,4-butanediol diglycidyl ether at 120 °C over three hours under argon atmosphere (page 116). The ionic conductivity of this hybrid electrolyte is greater than $1 \times 10^{-3} \Omega \text{ cm}^{-1}$ (see Figure 1). It is noted that applicants state on page 9, line 28 to page 10, line 1 that the nitrogen group in the gel polymer electrolyte serves to increase the cell voltage before the cell is actually charged. Thus, the lithium polymer batteries using this hybrid electrolyte would inherently have a pre-charge voltage of at least about 0.3 V or greater due to the presence of the amino groups in the polymer electrolyte.

The court has held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP 2112 and 2112.01. When the Examiner has provided a sound basis for believing that the products of the applicant and the prior

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art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Double Patenting

16. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

17. Claims 1, 5, 6, 8, 9, 15-18, 21, 22, 24, 25, and 31-33 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1, 4, 5, 7, 8, 13-16, 18, 19, 21, 22, and 27-29 of copending Application No. 09/760,720. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

18. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

19. Claims 2, 7, 10, 23, 26, and 34-36 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2, 6, 9, 20, 23 and 30-32 of copending Application No. 09/760,720. Although the conflicting claims are not identical, they are not patentably distinct from each other because instant claim 2 is broader than claim 2 of the copending application and is anticipated by claim 2 of the copending application. Similarly, instant claim 10 of the present application is broader than claim 9 of the copending application and is anticipated by claim 9 of the copending application. Instant claim 26 of the present application is broader than claim 23 of the copending application and is anticipated by claim 23 of the copending application.

Claim 7 of the present application recites the range of 1×10^{-3} to about 1×10^{-2} S/cm and it is anticipated by the range of about 3×10^{-3} to about 1×10^{-2} S/cm of claim 6 of the copending application.

Claim 23 of the present application recites the range of about 1×10^{-3} to about 1×10^{-2} S/cm and it is anticipated by the range of about 3×10^{-3} to about 1×10^{-2} S/cm of claim 20 of the copending application.

Claim 34 of the present application recites the range of the liquid electrolyte present in an amount of about 95 wt% or greater which is anticipated by the range of 30 wt% to about 99 wt. % of claim 30 of the copending application.

All the limitations of claims 35 and 36 of the present application are anticipated by claims 31 and 32 of the copending application.

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This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

20. Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster, Ph.D. whose telephone number is (703) 305-0588. The examiner can normally be reached on Monday through Thursday from 9:30 AM to 8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900.

The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9310 for regular communications and (703) 872-9311 for After-Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

st/8 March 2003

Susy Tsang Foster